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Editorial: Impacts of anchor scour, vessel moorings and associated infrastructure on marine habitats

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Editorial on the Research Topic

Impacts of anchor scour, vessel moorings and associated infrastructure on marine habitats

There has been growing awareness and interest in the potential impacts of vessel anchoring and mooring on benthic environments and the biota they support (Broad et al., 2020). This Research Topic in *Frontiers in Conservation Science* sought to bring the issues associated with anchoring and mooring to a wider audience, increase awareness and encourage further research. We hoped to fill some important knowledge gaps in this field and ultimately move to real world solutions.

Changing awareness

Almost a decade ago, Davis and co-workers (Davis et al., 2016) lamented the lack of shipping industry recognition of the environmental impacts of commonplace anchoring practices. The environmental code of practice developed by the International Chamber of Shipping, failed to mention anchoring and its potential impacts (ICS, 2008). It is now pleasing to see that the latest 'Biodiversity' report from Loyd's Register (LR, 2025), an independent training and advisory body for the maritime industry, includes a section on anchoring impacts, making reference to the scientific literature and briefly lists a number of potential solutions. Importantly, the LR report was launched at the UN's 2025 Oceans Conference in Nice, France and was subsequently publicised on several Maritime Industry websites. Curbing ship anchoring for environmental reasons still remains focussed on reduction in fossil fuels (e.g., Andersson and Ivehammar, 2017; Poulsen and Sampson, 2019) possibly related to global carbon-reduction incentive schemes and future net-zero goals adopted by the International Maritime Organisation (<https://www.imo.org/en/mediacentre/hottopics/pages/faqs-the-imo-net-zero-framework.aspx>). So, although awareness of anchoring and its impacts has increased, unfortunately some recent scientific contributions have failed to recognise the threat posed to benthic environments from anchoring activities (e.g., Jägerbrand et al., 2019; Agarwala and Saengsupavanich, 2023).

Filling knowledge gaps

This special topic contains a series of firsts. These include assessments of anchoring by large vessels in regions or habitats that have not yet received attention. The article examining the impacts of anchoring cruise vessels on Antarctic and subantarctic benthic environments highlighted disturbing levels of damage in these sensitive high latitude environments (Mulrennan et al.). It proved particularly topical with subsequent coverage in the mainstream media and prompted a response from the International Association of Antarctica Tour Operators (IAATO - <https://iaato.org/safeguarding-antarctica-iaato-responds-research-anchoring-impacts-southern-ocean>). Other articles in this Research Topic reveal wholesale changes in assemblages as a result of anchor scour. These include within unvegetated deep (30–60 m) sediment environments (Davis et al.) and among reef-associated temperate zone fishes (Broad et al.). These studies confirm that outcomes of anchoring can be complex and difficult to predict.

It is worth emphasising that some important work on anchoring impacts by large vessels in other geographic regions (including the Adriatic, Baltic, Mediterranean and Canadian waters) has appeared recently outside of this Research Topic (Pitacco et al., 2023; Hannah et al., 2024; Diaz-Mendoza et al., 2025; Jimenez et al., 2025). We anticipate that the article on determining an accessible and remote sensing method of obtaining the anchoring impacts in this Research Topic will encourage further research in other regions (Small and Oxenford). These authors provide a cost-effective means of applying AIS (ship positional) data to better interpret the spatial patterns of anchoring and the movements of vessels. This spatial information on anchorages can be critical to the effective management of anchoring (Davis et al., 2022).

Important knowledge gaps remain. Chief among these is refining the spatial scale of anchoring globally (Watson et al., 2022) and better understanding the evolution and persistence of anchor tracks on the benthos (Schulze et al., 2025). There is a need to better integrate the biological impacts with the geomorphological changes wrought by anchors and chains on the benthos. The impact of ship anchoring on sediment resuspension and resettling along with shorter-term water column changes (e.g., elevated turbidity) also warrants further investigation and is largely undocumented in the scientific literature. These secondary disturbances, as they have been called, are given consideration in this Research Topic (Griffin et al.). Currently, rates of recovery from anchoring in any habitat remains largely unknown. In addition, light and noise pollution while vessels are at anchor or steaming at slow speed remains virtually unexplored, even though preliminary research suggests correlations between changes in megafauna behaviour and the presence of anchored vessels (Carome et al., 2022; 2023; 2024).

Seeking real world outcomes

It is our hope that this Research Topic has moved the field forward. In this Research Topic, Broad et al. conclude with a series of recommendations to reduce or even eliminate anchoring footprints.

Currently local regulations determine the anchoring practices at any given location, but to be effective international regulations need to be developed. These are important considerations given the predicted fourfold increase in maritime trade and associated port congestion by 2050 (Hanson and Nicholls, 2020), increasing anthropogenic stress on the ocean and the response of biota to multiple stressors. If the promise of the Blue Economy is to be realised, it is critical that scientists, the shipping Industry and natural resource managers engage for better outcomes.

Author contributions

AD: Conceptualization, Project administration, Writing – original draft, Investigation. SW: Conceptualization, Investigation, Project administration, Writing – review & editing.

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